The Report committee for Devan Rae McDonald

Certifies that this is the approved version of the following report:

Individual Benefit Calculations: An Introduction to a Career as a Corporate Pensions Actuary

Approved by
Supervising Committee:

James W. Daniel

Christopher S. Johnson

Individual Benefit Calculations: An Introduction to a Career as a Corporate Pensions Actuary

by

Devan Rae McDonald, B.S.

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Abstract

Individual Benefit Calculations: An Introduction to a Career as a Corporate Pensions Actuary

by

Devan Rae McDonald, M.A.

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Supervisor: James W. Daniel

While working as an intern in the corporate pensions department of Rudd and Wisdom, Inc., Consulting Actuaries, I learned about the different kinds of pension plans available to businesses and became familiar with the process of benefit calculation. I performed several benefit calculations for clients under different scenarios and plan specifications.

When a participant of a pension plan retires, terminates employment, dies, or becomes disabled, the participant (or his or her beneficiary) may request a calculation to illustrate benefit options. In each case, the methods used to perform such a calculation and the benefit options available to the participant or beneficiary are different. In this report, I will demonstrate a number of scenarios illustrating plan provisions and methods of calculation.

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INTRODUCTION

Background and Introduction of Internship

As an intern with Rudd and Wisdom, Inc., Consulting Actuaries, I performed individual benefit calculations for several different clients when their employees or beneficiaries of their employees requested to begin payment for retirement, severance, or a death benefit. After I carried out the initial calculation, I prepared the paperwork necessary for the participant (or the beneficiary of the participant) of the pension plan to commence benefit payments. Next, the actuarial analyst in charge of checking calculations for the client reviewed the calculation for accuracy. Finally, I made corrections to the calculation so that a credentialed actuary could review it and sign the paperwork. This review process ensured that the benefit package arrived to the client without mistakes.

Many of the pension plans for which I performed benefit calculations were defined benefit plans. A defined benefit plan is a pension plan that involves an employer provided benefit based upon the number of years that an employee works for the company full time and the employee's annual compensation. Based on the details provided in the plan document, the participant can usually withdraw his or her benefits as a lump sum after termination, have the money rolled over into another account, or defer payment until he or she retires. In this report, I will describe the calculations needed to determine the exact amounts of different types of benefit payments.

Individual benefit calculations play a vital role in the daily operation of the corporate pensions department of Rudd and Wisdom, Inc. The calculations not only allow new employees to familiarize themselves with the different plans that the actuaries are hired to oversee, but also they are a necessary component of pension plans. After all, a pension plan's sole purpose is to provide retirement benefits for its participants. The benefit calculation process allows for each participant to receive an accurate payment.

Overview of Sample Pension Plan

Actuarial Memorial Hospital (AMH) employs more than 2500 nurses, doctors, and general staff members. Each of its employees is required to participate in the hospital's pension plan upon employment. On June 30, 2006, Actuarial Memorial Hospital decided to freeze its pension plan. In other words, any employee who was hired prior to June 30, 2006, was automatically vested, meaning that each of these employees was entitled to receive his or her frozen benefit upon termination or retirement. In addition, any employee who was hired after June 30, 2006, could not participate in the plan. The frozen benefit was equal to 1.5% of Average Monthly Compensation (AMC) multiplied by the participant's years of service – the number of years from date of hire to the earlier of the date of termination or June 30, 2006. AMC is calculated by adding the employee's compensation for the five highest consecutive years of full time employment and dividing by sixty to produce an average monthly salary based on a 360-day year.

The accrued benefit, also known as the Normal Retirement Benefit (NRB), mentioned above is the monthly benefit payable to the participant as a life-only annuity on his or her normal retirement date (age sixty-five). A life-only annuity is a set of

payments that are paid, in this case, at the beginning of each month (making it a monthly annuity due) until the participant dies. If the participant terminates prior to his or her normal retirement date and chooses not to defer payment until such date, the benefit is reduced by interest and mortality to be actuarially equivalent to the NRB.

The actuaries who perform benefit calculations for Actuarial Memorial Hospital use the 1984 Unisex Pensioner Mortality Table (see Appendix A) published by the Internal Revenue Service (IRS) with 8% annual interest to calculate optional forms of payment for retirement benefits. For calculating lump sums, the actuaries must use the applicable mortality table and applicable interest rate under IRS Code Section 417(e) to discount the benefit payments. Currently, the applicable interest rates are segment rates – interest rates that model the growth of a lump sum payout – that the IRS publishes monthly (see Appendix B).

SCENARIOS OF BENEFIT CALCULATIONS

Vested Termination

Actuarial Memorial Hospital hires Jane Doe on November 6, 1998. Ms. Doe terminates employment on May 20, 2009. She is thirty-nine years and eight months old as of her date of termination, so she has not yet reached her retirement date of October 1, 2034. Her AMC, calculated using her compensation from 2001 to 2005, is $3,575.55. The number of years from November 6, 1998 to June 30, 2006, is 7.65 years. Ms. Doe's accrued benefit is equal to 1.5% * 3,575.55 * 7.65, or $410.29. Since Ms. Doe has terminated prior to her normal retirement date and has chosen not to defer her benefit to such date, her only option is a lump sum payment.

Based on the prescribed mortality table and the May 2009 segment rates published by the IRS, Ms. Doe's lump sum factor is 42.851. The lump sum factor multiplied by the NRB of $410.29 produces a lump sum amount of $17,581.34. The lump sum is calculated in such a way that if on July 31, 2009, Ms. Doe were to deposit $17,581.34 into a savings account paying 4.24% annual interest for the first five years, 4.78% for the next ten, and 4.74% for all later years, she would have enough money to fund a life-only monthly annuity of $410.29, beginning on the first day of the month following her sixty-fifth birthday.

The entire amount of the lump sum is taxable by the IRS. However, if Ms. Doe chooses a direct rollover to another qualified pension plan or to an Individual Retirement Account (IRA), she will not have to pay taxes on the amount until the time she withdraws

the funds. In some cases, it is beneficial to defer tax payment since another pension plan may be subject to different tax treatment than the Actuarial Memorial Hospital pension plan. The amount rolled over into the new account is automatically subject to the tax rules of the new plan or the IRA.

Early Retirement

Actuarial Memorial Hospital hires Janet Doeson on May 12, 1992. Ms. Doeson terminates employment on July 13, 2007. She chooses not to request a benefit calculation until June 2009. Her date of birth is March 5, 1954, so she is fifty-five years and three months old as of the first monthly benefit payout date, July 1, 2009. Although she has not yet reached her normal retirement date of April 1, 2019, Ms. Doeson may receive early retirement benefits commencing July 1, 2009, since she has attained age fifty-five. Her husband, Mr. Doeson, is sixty-five years and five months old as of July 1, 2009. His age is a consideration in the calculations since early retirement benefits are payable in optional monthly forms.

Ms. Doeson's AMC, using compensation from years 2001 to 2005, is $4,902.13. Since Ms. Doeson was a part-time employee between October 1, 1994 and March 15, 1999, she is not credited service between the two dates. As a result, her total service from May 12, 1992 to June 30, 2006, is 9.678 years. Her NRB is 1.5% * 4,902.13 * 9.678, or $711.64. Ms. Doeson may receive her benefit in several different forms: she can begin receiving annuity payments immediately, defer the annuity payments to her normal retirement age, receive a lump sum distribution immediately, or have the lump sum rolled over into another pension plan or IRA.

If Ms. Doeson chooses to defer the annuity payments to her normal retirement date, she will begin receiving payments of $711.64 at the beginning of each month starting on April 1, 2019, and continue receiving payments for the remainder of her life. However, if she wishes to commence monthly payment immediately, her benefit will be reduced by an early retirement factor. For the first sixty months preceding her normal retirement date, the monthly benefit is reduced by a factor of 1/180. For the remaining months, the monthly benefit is reduced by a factor of 1/360. Since Ms. Doeson is fifty-five years and three months old as of July 1, 2009, the early retirement factor equals 1-60/180-57/360, or 0.508333. The resulting reduced monthly benefit amount is $361.75.

Since Ms. Doeson is married, she can choose from eight annuity forms: life-only, five years certain and life, ten years certain and life, fifteen years certain and life, 50% joint and contingent, 75% joint and contingent, 2/3 joint and survivor, and 100% joint and survivor. A certain and life annuity is one that guarantees a pre-determined number of years of annuity payments, followed by payments for the remaining lifetime of the pensioner. A joint and contingent annuity is one that pays a monthly benefit as long as the pensioner is alive, and upon the death of the pensioner, continues to pay a reduced amount to the joint pensioner for the remainder (if any) of his or her lifetime. A joint and survivor annuity is one that pays a monthly benefit as long as both the pensioner and the joint pensioner are alive, and upon the death of either, continues to pay a reduced amount to the living spouse for the remainder of his or her lifetime. Each optional annuity form is calculated using the prescribed mortality table and 8% effective annual interest.

Ms. Doeson has the option to receive an immediate lump sum payout. The lump sum can either be rolled over into another retirement account or paid out in cash. If Ms.

Doeson chooses to take a cash payout, she will receive $63,469.25, or $711.64 multiplied by the lump sum factor of 89.1873. Again, the lump sum is calculated in such a way that if on July 31, 2009, Ms. Doeson deposits $63,469.25 into a savings account paying 4.24% annual interest for the first five years, 4.78% for the next ten, and 4.74% for all later years, she will have enough money to fund a life-only annuity paying $711.64 and beginning on the first day of the month following her sixty-fifth birthday.

Normal Retirement

Actuarial Memorial Hospital hires Janice Doeman on April 6, 1987. Ms. Doeman terminates employment on April 27, 1990. On June 29, 1993, Ms. Doeman begins working for Mathematical Memorial Hospital (MMH). She terminates employment with MMH on November 7, 2000. Since both hospitals are in the same hospital system and have identical pension plans, Ms. Doeman is credited service and compensation from both hospitals but receives two different benefits. Ms. Doeman decides to wait until her normal retirement date, April 1, 2009, to request a benefit calculation for her time with Actuarial Memorial Hospital.

Ms. Doeman's AMC, using compensation from years 1995 to 1999, is $2,144.08. Her service for Actuarial Memorial Hospital is 3.0583 years, while her service for Mathematical Memorial Hospital is 7.3556 years. Thus, her total service is 10.4139 years, making her total NRB equal to 1.5% * 2,144.08 * 10.4139, or $334.93. The portion of the NRB attributable to Actuarial Memorial Hospital is the total NRB multiplied by the fraction of time that she was employed with that hospital. Ms. Doeman's AMH accrued benefit is equal to $334.93 * 3.058/10.4139, or $98.36.

Ms. Doeman will receive the full amount of her accrued benefit since she is commencing payment on her normal retirement date. The NRB of $98.36 is the amount of the monthly life-only annuity beginning April 1, 2009. Since Ms. Doeman is unmarried, she may choose from four monthly payment options: life-only, five years certain and life, ten years certain and life, or fifteen years certain and life. She may also elect to receive a lump sum distribution. The lump sum factor based on interest and mortality is 159.6787, causing the lump sum amount to be equal to $15,706.00. The lump sum payment and the life-only annuity are actuarially equivalent.

Late Retirement

Actuarial Memorial Hospital hires Janine Doefield on March 3, 1994. Ms. Doefield terminates employment on November 6, 2008. Her date of birth is August 7, 1941, so she is sixty-seven years and three months old, as of the payout date of December 1, 2008. She was still employed as of her normal retirement date of September 1, 2006; consequently, she qualifies for late retirement.

Ms. Doefield is entitled to the larger of her accrued benefit as of her late retirement date or the value of her accrued benefit as of her normal retirement date actuarially increased to her late retirement date. Since the pension plan was frozen on June 30, 2006, her normal retirement benefit and her late retirement benefit are equal. As a result, the larger benefit is her normal retirement benefit actuarially increased to her late retirement date.

Ms. Doefield's AMC, using compensation from years 2001 to 2005, is equal to $3,011.62. The time from her date of hire to June 30, 2006, is 12.325 years. Therefore,

her normal retirement benefit and late retirement benefit are computed to be 1.5% * 3,011.62 * 12.325, or $556.77. Her benefit actuarially increased (using the prescribed mortality table and 8% annual effective interest) to her late retirement date of December 1, 2008, is $667.94.

Since Ms. Doefield is unmarried, she may choose from four monthly benefit options and a lump sum distribution. The lump sum factor, based on interest and mortality, is 151.7389. The lump sum amount is 151.7389 * $667.94, or $101,352.48. Since the accrued benefit and life-only annuity amount takes into account the elapsed time from her normal retirement date and her late retirement date, no other adjustments are needed.

Death

Actuarial Memorial Hospital hires John McDoe on June 2, 1983. Mr. McDoe dies on May 17, 2009. Upon entry into the AMH pension plan, Mr. McDoe signs a Beneficiary Designation Form naming his mother, Janae McDoe, his joint pensioner. If Mr. McDoe had been married at the time of his death, the value of the death benefit payable to his mother would have been reduced by the actuarially equivalent of the Pre-retirement Surviving Spouse Annuity. The details of this provision will be discussed in situation six.

Mr. McDoe's date of birth is January 18, 1967, making his normal retirement date February 1, 2032. On the date of his death, Mr. McDoe is forty-two years and three months old, while his mother is sixty-five years and four months old. Ms. McDoe can

choose between a monthly benefit and a lump sum distribution, each payable immediately.

The calculation of the monthly life-only annuity amount payable to Ms. McDoe begins with the calculation of Mr. McDoe's NRB. His AMC, using compensation from years 2001 to 2005, is $1,679.12. The elapsed time from his date of hire, June 2, 1983, to June 30, 2006, is 23.078 years. Finally, Mr. McDoe's accrued benefit at his normal retirement date is 1.5% * 1,679.12 * 23.078, or $581.26.

Since it will not be Mr. McDoe who receives the benefit, it is not appropriate to base the annuity amount on his mortality. Therefore, the amount of the life-only annuity payable to Ms. McDoe beginning on June 1, 2009, is equal to an amount based on Ms. McDoe's age at Mr. McDoe's death and Mr. McDoe's age at normal retirement. Mr. McDoe's NRB of $581.26 is converted to a lump sum distribution payable on his normal retirement date. The lump sum is then converted back to a life-only annuity but is based on Ms. McDoe's age at Mr. McDoe's death. The result of the conversion gives a life-only annuity of $87.73 payable monthly to Ms. McDoe beginning June 1, 2009. Ms. McDoe can choose from a life-only, a five year certain and life, a ten year certain and life, or a fifteen year certain and life annuity. Ms. McDoe may also choose to receive a lump sum distribution. The amount of the lump sum is calculated in the same manner as any other scenario.

Death – Two Beneficiaries

In the previous example, John McDoe is unmarried and has designated his mother as his sole beneficiary. In this scenario, Mr. McDoe marries on May 16, 2009, one day

before his untimely death. Mr. McDoe did not have the time to amend his beneficiary designation form to include his new bride, so Janae McDow must share the death benefit with her new daughter-in-law, Jamie McDoe.

Jamie McDoe is entitled to receive the Qualified Pre-retirement Survivor Annuity. The benefit associated with the Qualified Pre-retirement Survivor Annuity is calculated in such a way that assumes that the participant, Mr. McDoe, terminated employment on his date of death, survived to his earliest retirement date of February 1, 2022, and died on February 2, 2022, after electing a 50% joint and contingent annuity with his spouse as the joint pensioner. The benefit due to Mrs. McDoe is the actuarial equivalent value of 50% of the joint and contingent annuity with payments commencing on June 1, 2009.

In the previous example, Mr. McDoe's normal retirement benefit is $581.26. If he had retired on February 1, 2022, at the age of fifty-five, his early retirement benefit would have been $581.26 * (1-60/180-60/360), or $290.63. Mrs. McDoe's date of birth is October 26, 1970. Her age at Mr. McDoe's early retirement date of February 1, 2022, would have been fifty-one years and three months. Based on Mr. and Mrs. McDoe's ages and the prescribed mortality table using 8% annual effective interest, the 50% joint and contingent annuity amount is $272.50. Mrs. McDoe is entitled to the actuarial equivalent of a $136.25 life-only annuity with payments commencing March 1, 2022, payable beginning on June 1, 2009.

The amount of the benefit due to Mrs. McDoe on June 1, 2009, is calculated by equating a $136.25 twelve year and nine month deferred life only monthly annuity due for a fifty-one year and four month old female to an "$X" life only monthly annuity due

for a thirty-eight year and seven month old female. Using the prescribed mortality table and 8% annual effective interest, the value of "X" is $59.46.

To evaluate the portion to be paid to John McDoe's mother, the annuity amount determined in the previous example must be converted to a lump sum amount. The lump sum value of the annuity payable to Mrs. McDoe must also be converted to a lump sum amount and be subtracted from her mother-in-law's lump sum amount. The resulting value should then be converted to a life only annuity payable to Mr. McDoe's mother commencing June 1, 2009. The lump sum amount that is actuarially equivalent to Janae McDoe's life only annuity of $87.73 is $9,150.44. The lump sum amount that is actuarially equivalent to Jamie McDoe's life only annuity of $59.46 is $8,563.57, leaving a lump sum amount of $586.87 payable as a monthly life only annuity of $5.63 to Janae McDoe.

Since the Qualified Pre-retirement Survivor Annuity must be a portion of the 50% joint and contingent annuity, neither Janae McDoe nor Jamie McDoe may receive a lump sum payment. Each will be paid a life only annuity commencing on June 1, 2009, and continuing until each of their deaths.

Disability

Actuarial Memorial Hospital hires Janaynay Doely on June 23, 1988. Ms. Doely becomes disabled and terminates employment on December 5, 1994. Under the plan provisions, Ms. Doely is entitled to receive a monthly disability benefit equal to her normal retirement benefit with service granted from her date of disability to her normal retirement date. The disability benefit is payable until her normal retirement date. If she

survives to age sixty-five, Ms. Doely will receive a reduced retirement benefit beginning on the first of the month following her sixty-fifth birthday. Ms. Doely's date of birth is April 26, 1941, so her normal retirement date is May 1, 2006. Since Ms. Doely terminates employment when she becomes disabled, she should also receive a termination benefit. The plan freeze date does not affect the calculation of Ms. Doely's normal retirement benefit since both her termination date and her normal retirement date are prior to June 30, 2006.

Ms. Doely's average monthly compensation, calculated using compensation from years 1990 to 1994, is $937.20. The time from her date of hire of June 23, 1988, to her date of disability of December 5, 1994, is 6.45 years. Her normal retirement benefit at her date of disability is equal to 1.5% * 937.20 * 6.45, or $90.67. Ms. Doely may choose between a life only annuity of $30.33 and a lump sum payment of $7,190.64. If Ms. Doely chooses the lump sum payment option, she can either receive an immediate distribution or have the amount rolled over to another retirement account. Both payment options (monthly annuity and lump sum) are actuarially equivalent.

The disability benefit is calculated using the same average monthly compensation but takes into account service from the date of disability to the normal retirement date. The time from Ms. Doely's date of hire of June 23, 1988, to her normal retirement date of May 1, 2006, is 17.856 years. Therefore, her disability benefit prior to normal retirement is equal to 1.5% * 937.20 * 17.856, or $251.02. Since the only payment option available under the plan provisions for a disability benefit is a life only annuity, Ms. Doely will receive a monthly payment of $251.02 for the remainder of her life or until her normal retirement date.

As of April 26, 2006, Ms. Doely remains alive and disabled. Beginning on May 1, 2006, she will begin receiving a retirement benefit supplemented by a disability benefit. Since Ms. Doely does not return to work, her retirement benefit is $90.67. Since Ms. Doely is unmarried, she can choose from a life only, five years certain and life, ten years certain and life, and a fifteen years certain and life annuity. She also has the option to withdraw her retirement benefit as an immediate lump sum payment of $13,192.90 or to roll the lump sum amount over to either another qualified pension plan or another retirement account.

Ms. Doely's disability benefit commencing on May 1, 2006, is reduced by the accrued retirement benefit commencing on the same day. Therefore, her disability benefit after her normal retirement date is equal to the difference between her disability benefit prior to her normal retirement date and the accrued retirement benefit. The disability benefit commencing on May 1, 2006, is equal to $251.02 - $90.67, or $160.35. Again, her only option for receiving the disability benefit is a monthly life only annuity.

Had Ms. Doely returned to work prior to her normal retirement date, she would no longer have been entitled to a disability benefit. However, she would have been granted service for the period during which she was disabled. Upon attaining age sixty-five, Ms. Doely would have received a normal retirement benefit reduced by the actuarial present value of the termination benefit that she had already received.

Divorce Settlement

Actuarial Memorial Hospital hires Jan Doezy on March 20, 1978. She marries Joe Doezel on December 8, 1979, and becomes Jan Doezel. After being married for nearly

seventeen years, they file for divorce on October 7, 1996. As a part of the divorce settlement, Mr. Doezel is awarded 45% of Ms. Doezel's retirement benefit. The provisions of the division are stipulated in the Qualified Domestic Relations Order (QDRO).

A Domestic Relations Order is a document outlining the division of employee benefits as ordered by a court during divorce proceedings. For a Domestic Relations Order to be "qualified," it must meet certain requirements. The consulting actuary assigned to the pension plan would be the person to deem a Domestic Relations Order qualified.

The QDRO related to the Doezel divorce stipulates that Mr. Doezel should receive 45% of Ms. Doezel's retirement benefit that accrued from the date of the marriage to the date of divorce. Mr. Doezel is known as the alternate payee in this situation. The accrued retirement benefit is based on Ms. Doezel's compensation and service, but the monthly payment is based on Mr. Doezel's mortality. Mr. Doezel may begin receiving monthly payments on the date that Ms. Doezel attains age fifty.

Jan Doezel was born on May 27, 1959, so her former husband, Joe Doezel, may commence payment on June 1, 2009. During her employment, Ms. Doezel was a part time employee from December 31, 1984, to August 4, 1986. She did not accrue service during this time. With the break in service taken into account, her service from the date of the marriage, December 8, 1979, to the date of divorce, October 7, 1996, was 15.238 years. Ms. Doezel's AMC, calculated using compensation from years 1991 to 1995, is $1,783.81. Her accrued benefit while she was married is equal to 1.5% * 1,783.81 *

15.238, or $407.73. Mr. Doezel's portion of the accrued benefit is 45% * 407.73, or $183.48.

The amount of the life-only annuity payable to Mr. Doezel beginning on June 1, 2009, is equal to an amount based on his age on June 1, 2009, and his age on Ms. Doezel's normal retirement date of June 1, 2024. Mr. Doezel's date of birth is February 14, 1957, so his age at June 1, 2009, is fifty-two years and three months, and his age at June 1, 2024, is sixty-seven years and three months. His portion of the accrued benefit of $183.48 is converted to a lump sum distribution payable on June 1, 2024. The lump sum is then converted back to a life-only annuity and is based on Mr. Doezel's age on June 1, 2009, of fifty-two years and three months. The result of the conversion gives a life-only annuity of $40.07 payable monthly to Mr. Doezel beginning June 1, 2009. He can choose from a life-only, a five year certain and life, a ten year certain and life, or a fifteen year certain and life annuity. Mr. Doezel may also choose to receive a lump sum distribution. The amount of the lump sum is calculated in the same manner as any other scenario. The entire amount of each disbursement is considered taxable and must be reported to the IRS as retirement income.

If Ms. Doezel had died before her fiftieth birthday, Mr. Doezel would have received a Qualified Pre-retirement Survivor Annuity. The amount of the accrued benefit would not change, but the monthly payment amount would be based on an earlier commencement date. If Mr. Doezel had died before Ms. Doezel's fiftieth birthday, then his designated beneficiary would have received a death benefit commencing on June 1, 2009. The payment amount would be determined in a similar manner as above but would be based on the beneficiary's mortality.

Vested Termination of a Grandfathered Participant

When Actuarial Memorial Hospital decided to freeze its pension plan on June 30, 2006, it also amended the plan provisions to include a "Rule of Seventy." The Rule of Seventy states that any employee whose age and total service sum to at least seventy as of June 30, 2006, may elect to continue participating in the pension plan as though the freeze never happened. These grandfathered individuals will accrue a benefit based on service and compensation up to and after June 30, 2006.

Actuarial Memorial Hospital hires Janie Doey on January 1, 1986. Ms. Doey terminates employment on February 22, 2009. Since Ms. Doey's date of birth is January 15, 1956, she is fifty years and five months old as of June 30, 2006. Her total service from her date of hire to June 30, 2006, is 20.497 years. Because her age and service totals more than seventy, she is eligible to be a grandfathered participant, and she accepts the option. If Ms Doey is rehired at a later date, she will still be considered a grandfathered participant.

Ms. Doey's AMC, calculated using compensation from years 2004 to 2008, is $2,564.22. Her total service from January 1, 1986, to February 22, 2009, is 23.142 years. Ms. Doey's benefit at her normal retirement date is 1.5% * 2,564.22 * 23.142, or $890.12. Since Ms. Doey does not yet qualify for early retirement, her termination benefit is payable as a lump sum distribution only. The lump sum amount is calculated using the lump sum factor based on the prescribed mortality table and IRS published segment rates. If Ms. Doey had declined the option to be a grandfathered participant, her

NRB would have been smaller than the calculated amount since her compensation and service increased after June 30, 2006.

Late Retirement of a Grandfathered Participant

Actuarial Memorial Hospital hires Jonas Doerty on October 24, 1996. In June 2009, Mr. Doerty elects to commence his retirement benefits while still employed with the hospital. A participant can begin commencement of retirement benefits as soon as he or she reaches normal retirement age. When the participant chooses to commence benefits while actively employed, the commencement is known as an in-service retirement. Mr. Doerty's date of birth is July 13, 1933, so his age at the commencement date of July 1, 2009, is seventy-five years and eleven months, and he will be eligible for in-service late retirement. On June 30, 2006, his total service is 8.183 years due to two periods of part-time employment. His age on the same date is seventy-two years and eleven months. Since he qualifies as a "Rule of Seventy" participant, he chooses to continue participation after the freeze date.

If a participant retires after the age of 70 ½, the IRS mandates a minimum required distribution (MRD) for employee benefits. A participant cannot receive a benefit less than his or her accrued benefit amount actuarially increased from each minimum required distribution date to the commencement date. The first MRD date is the April 1st of the calendar year following the calendar year during which the participant attains age 70 ½. Mr. Doerty attains age 70 ½ on January 13, 2004. Therefore, his first MRD date is April 1, 2005. Each December 31st after the first minimum required distribution is also a minimum required distribution date.

Mr. Doerty's five minimum required distribution dates are April 1, 2005; December 31, 2005; December 31, 2006; December 31, 2007, and December 31, 2008. The actuarial increase of the benefit on these dates will also be compared to the benefit amount on the date of commencement, July 1, 2009. The benefit amount on each of the minimum required distribution dates is calculated using compensation prior to the date and service accumulated up to the date.

Mr. Doerty's average monthly compensation as of April 1, 2005, calculated using compensation from years 2000 to 2004, is $1,293.96. His accumulated service up to April 1, 2005, is 6.936 years. His benefit on the first MRD date is 1.5% * 1,293.96 * 6.936, or $134.62. His AMC as of December 31, 2005, calculated using compensation from years 2001 to 2005, is $1,357.43. His accumulated service up to December 31, 2005, is 7.686 years. His benefit on the second MRD date is 1.5% * 1,357.43 * 7.686, or $156.50. His AMC as of December 31, 2006, using compensation from years 2002 to 2006, is $1,418.60. His accumulated service up to December 31, 2006, is 8.686 years. His benefit on the third MRD date is 1.5% * 1,418.60 * 8.686, or $184.83. His AMC as of December 31, 2007, using compensation from years 2003 to 2007, is $1,481.55. His accumulated service up to December 31, 2007, is 9.686 years. His benefit on the fourth MRD date is 1.5% * 1,481.55 * 9.686, or $215.25. His AMC as of December 31, 2008, using compensation from years 2004 to 2008, is $1,528.42. His accumulated service up to December 31, 2008, is 10.686 years. His benefit on the fifth MRD date is 1.5% * 1,528.42 * 10.686, or $244.99. His AMC as of July 1, 2009, using compensation from years 2004 to 2008, is also $1,528.42. His accumulated service up to July 1, 2009, is

11.186 years. His benefit on the commencement date is 1.5% * 1,528.42 * 11.186, or $256.45.

The benefit on each MRD date is then actuarially increased to the commencement date of July 1, 2009. The five actuarially increased benefit amounts in order from the first to fifth MRD dates are $212.05, $227.91, $242.16, $253.39 and $258.77. Since $258.77 is greater than the benefit as of the commencement date, it will be used as the life only late retirement benefit.

Since he is married, if Mr. Doerty elects to receive a monthly benefit, he can choose from eight payment options: life only, five years certain and life, ten years certain and life, fifteen years certain and life, 50% joint and contingent, 75% joint and contingent, 2/3 joint and survivor, and 100% joint and survivor. Mr. Doerty may also elect an immediate lump sum distribution. Each payment option is actuarially equivalent to the others.

CONCLUSION

From calculating termination, retirement and death benefits, I learned a great deal about life contingencies and the basic components of pension plans. Not all of the pension plans to which I was exposed were as simple as the plan used in the scenarios. Some of the plans were defined contribution plans, so they depended on the state of the economy instead of years of service and compensation. Other defined benefit plans required that the participants make contributions during each pay period. No two plans were the same, and some contained numerous complications. Through calculating individual benefits for participants in unusual situations and reading the plan document associated with each client, I learned many details about each of the pension plans.

Not only did the scenarios that I encountered help to prepare me for completing more benefit calculations, they also exposed me to current IRS requirements and legislation. Since keeping up with pension legislation is a fundamental job requirement for a pensions actuary, an early introduction to the IRS Code is ideal. In order to properly calculate the benefit for the late retirement of the participant who worked past his first minimum required distribution date, I had to study the IRS Code pertaining to individuals over the age of 70 ½. Even the limited exposure to IRS regulation greatly influenced my experience as a pensions intern.

Individual benefit calculations play a vital role in the daily operation of the corporate pensions department of Rudd and Wisdom, Inc. The calculations allow new employees to familiarize themselves with the different plans that the actuaries are hired to oversee, and they are a necessary component of pension plans. After all, a pension plan's

sole purpose is to provide retirement benefits for its participants. The benefit calculation process allows for each participant to receive an accurate payment.

Appendix A – IRS Mortality Table

1984 - Unisex Pensioner Mortality Table (age adj: -3, interest rate: 8.00%)

Remember: the table has already been adjusted for the setback/setforward.

Age x	q_x	l_x	v^x	D_x	N_x	$N_x^{(12)}$	Annuity Due NSP: Life Onl
0	0.000700	1,000,000,000	1.00000000	1,000,000,000.00	13,310,775,845.69	12,852,442,512.36	154.2293
1	0.000700	999,300,000	0.92592593	925,277,777.78	12,310,775,845.69	11,886,690,197.54	154.1594
2	0.000700	998,600,490	0.85733882	856,138,966.05	11,385,498,067.91	10,993,101,041.81	154.0839
3	0.000700	997,901,470	0.79383224	792,166,359.98	10,529,359,101.86	10,166,282,853.54	154.0022
4	0.000600	997,202,939	0.73502985	732,973,929.19	9,737,192,741.89	9,401,246,357.68	153.9140
5	0.000550	996,604,617	0.68058320	678,272,356.32	9,004,218,812.70	8,693,343,982.72	153.8027
6	0.000520	996,056,484	0.63016963	627,684,543.08	8,325,946,456.37	8,038,257,707.46	153.6745
7	0.000550	995,538,535	0.58349040	580,887,173.26	7,698,261,913.29	7,432,021,958.88	153.5311
8	0.000635	994,990,989	0.54026888	537,562,671.59	7,117,374,740.03	6,870,991,848.89	153.3810
9	0.000720	994,359,169	0.50024897	497,427,147.49	6,579,812,068.45	6,351,824,625.85	153.2323
10	0.000805	993,643,231	0.46319349	460,249,074.02	6,082,384,920.96	5,871,437,428.69	153.0850
11	0.000890	992,843,348	0.42888286	425,813,494.00	5,622,135,846.93	5,426,971,328.85	152.9394
12	0.000975	991,959,717	0.39711376	393,920,851.84	5,196,322,352.93	5,015,775,295.84	152.7954
13	0.001060	990,992,557	0.36769792	364,385,906.49	4,802,401,501.09	4,635,391,293.95	152.6533
14	0.001145	989,942,105	0.34046104	337,036,719.84	4,438,015,594.60	4,283,540,431.34	152.5130
15	0.001230	988,808,621	0.31524170	311,713,715.55	4,100,978,874.76	3,958,110,088.46	152.3748
16	0.001315	987,592,386	0.29189047	288,268,803.41	3,789,265,159.20	3,657,141,957.64	152.2388
17	0.001400	986,293,702	0.27026895	266,564,564.75	3,500,996,355.79	3,378,820,930.28	152.1052
18	0.001453	984,912,891	0.25024903	246,473,494.78	3,234,431,791.04	3,121,464,772.59	151.9741
19	0.001437	983,481,813	0.23171206	227,884,600.73	2,987,958,296.25	2,883,511,187.58	151.8406
20	0.001414	982,068,549	0.21454821	210,701,046.82	2,760,073,695.52	2,663,502,382.39	151.6937
21	0.001385	980,679,904	0.19865575	194,817,699.57	2,549,372,648.70	2,460,081,203.06	151.5313
22	0.001351	979,321,663	0.18394051	180,136,923.20	2,354,554,949.13	2,271,992,192.66	151.3510
23	0.001311	977,998,599	0.17031528	166,568,109.46	2,174,418,025.93	2,098,074,309.09	151.1507
24	0.001267	976,716,443	0.15769934	154,027,535.81	2,007,849,916.47	1,937,253,962.55	150.9279
25	0.001219	975,478,943	0.14601790	142,437,391.59	1,853,822,380.66	1,788,538,576.18	150.6800
26	0.001167	974,289,834	0.13520176	131,725,704.08	1,711,384,989.07	1,651,010,708.03	150.4044
27	0.001149	973,152,838	0.12518682	121,825,907.58	1,579,659,284.98	1,523,822,410.68	150.0984
28	0.001129	972,034,686	0.11591372	112,672,157.05	1,457,833,377.40	1,406,191,972.09	149.7646
29	0.001107	970,937,258	0.10732752	104,208,287.21	1,345,161,220.36	1,297,399,088.72	149.4007
30	0.001083	969,862,431	0.09933733	96,382,341.33	1,240,952,933.15	1,196,777,693.37	149.0038
31	0.001058	968,812,070	0.09201605	89,146,258.57	1,144,570,591.82	1,103,711,889.98	148.5709
32	0.001083	967,787,067	0.08520005	82,455,501.69	1,055,424,333.26	1,017,632,228.31	148.0991
33	0.001111	966,738,953	0.07888893	76,265,002.20	972,968,831.57	938,014,038.89	147.5928
34	0.001141	965,664,906	0.07304531	70,537,288.69	896,703,829.36	864,374,238.71	147.0498
35	0.001173	964,563,083	0.06763454	65,237,783.01	826,166,540.67	796,265,890.13	146.4671
36	0.001208	963,431,650	0.06262458	60,334,499.15	760,928,757.66	733,275,445.55	145.8420
37	0.001297	962,267,825	0.05798572	55,797,791.74	700,594,258.51	675,020,270.63	145.1714
38	0.001398	961,019,763	0.05369048	51,597,612.97	644,796,466.77	621,147,560.83	144.4596
39	0.001513	959,676,258	0.04971341	47,708,777.32	593,198,853.81	571,332,330.87	143.7050
40	0.001643	958,224,268	0.04603093	44,107,957.35	545,490,076.49	525,273,929.37	142.9059
41	0.001792	956,649,905	0.04262123	40,773,599.98	501,382,119.14	482,694,219.15	142.0608
42	0.001948	954,935,589	0.03946411	37,685,679.34	460,608,519.16	443,335,916.13	141.1685
43	0.002125	953,075,374	0.03654084	34,826,173.74	422,922,839.82	406,960,843.53	140.2259
44	0.002327	951,050,089	0.03383411	32,177,933.44	388,096,666.09	373,348,446.59	139.2315
45	0.002556	948,836,995	0.03132788	29,725,051.29	355,918,732.64	342,294,750.80	138.1844
46	0.002818	946,411,768	0.02900730	27,452,846.35	326,193,681.35	313,611,126.78	137.0835
47	0.003095	943,744,780	0.02685861	25,347,670.58	298,740,835.01	287,123,152.66	135.9288
48	0.003410	940,823,889	0.02486908	23,397,425.50	273,393,164.42	262,669,344.40	134.7170
49	0.003769	937,615,680	0.02302693	21,590,407.67	249,995,738.92	240,100,135.41	133.4482
50	0.004180	934,081,806	0.02132123	19,915,771.69	228,405,331.26	219,277,269.23	132.1228
51	0.004635	930,177,345	0.01974188	18,363,447.93	208,489,559.57	200,072,979.27	130.7421
52	0.005103	925,865,973	0.01827952	16,924,382.73	190,126,111.65	182,369,102.90	129.3063
53	0.005616	921,141,278	0.01692548	15,590,757.04	173,201,728.92	166,055,965.28	127.8111
54	0.006196	915,968,149	0.01567174	14,354,814.21	157,610,971.88	151,031,682.03	126.2559
55	0.006853	910,292,810	0.01451087	13,209,140.54	143,256,157.67	137,201,968.26	124.6428
56	0.007543	904,054,574	0.01343599	12,146,868.79	130,047,017.13	124,479,702.27	122.9746
57	0.008278	897,235,290	0.01244073	11,162,263.85	117,900,148.34	112,784,110.74	121.2486
58	0.009033	889,807,976	0.01151920	10,249,872.81	106,737,884.48	102,040,026.11	119.4630
59	0.009875	881,770,341	0.01066592	9,404,894.17	96,488,011.67	92,177,435.18	117.6121
60	0.010814	873,062,859	0.00987585	8,622,241.52	87,083,117.50	83,131,256.80	115.6979
61	0.011863	863,621,557	0.00914431	7,897,222.78	78,460,875.98	74,841,315.53	113.7230
62	0.012952	853,376,415	0.00846695	7,225,498.17	70,563,653.19	67,251,966.53	111.6911
63	0.014162	842,323,483	0.00783977	6,603,623.63	63,338,155.02	60,311,494.19	109.5971
64	0.015509	830,394,498	0.00725905	6,027,873.25	56,734,531.39	53,971,756.15	107.4444
65	0.017010	817,515,910	0.00672134	5,494,802.75	50,706,658.14	48,188,206.88	105.2374
66	0.018685	803,609,964	0.00622346	5,001,237.18	45,211,855.39	42,919,621.69	102.9816
67	0.020517	788,594,512	0.00576247	4,544,249.13	40,210,618.22	38,127,837.36	100.6842
68	0.022562	772,414,918	0.00533562	4,121,309.97	35,666,369.09	33,777,435.35	98.3496
69	0.024847	754,987,693	0.00494039	3,729,930.53	31,545,059.11	29,835,507.62	95.9873
70	0.027232	736,228,514	0.00457443	3,367,826.81	27,815,128.58	26,271,541.29	93.6089
71	0.029634	716,179,539	0.00423558	3,033,439.02	24,447,301.77	23,056,975.55	91.2112
72	0.032073	694,956,274	0.00392184	2,725,505.64	21,413,862.75	20,164,672.66	88.7821
73	0.034743	672,666,942	0.00363133	2,442,676.39	18,688,357.11	17,568,797.10	86.3092
74	0.037667	649,296,474	0.00336234	2,183,157.85	16,245,680.72	15,245,066.70	83.7964
75	0.040871	624,839,424	0.00311328	1,945,300.78	14,062,522.86	13,170,926.67	81.2477

Appendix B – IRS Interest Table

Minimum Present Value Segment Rates

Generally for plan years beginning after December 31, 2007, the applicable interest rates under §417(e)(3)(D) of the Code are segment rates computed without regard to a 24 month average. For plan years beginning in 2008 through 2011, the applicable interest rate is the monthly spot segment rate blended with the applicable rate under §417(e)(3)(A)(ii)(II) of the Code as in effect for plan years beginning in 2007. For plan years beginning in the stated year, the following rates are the applicable interest rates for the month and year listed for minimum present value computations under §417(e)(3)(D) of the Code.

For Plan Years Beginning In	Month/Year	First Segment	Second Segment	Third Segment
2008	Jul-09	4.21	4.78	4.82
2009	Jul-09	4.00	5.16	5.23
2008	Jun-09	4.39	4.93	4.93
2009	Jun-09	4.27	5.35	5.33
2008	May-09	4.24	4.78	4.74
2009	May-09	4.25	5.34	5.25
2008	Apr-09	4.03	4.44	4.39
2009	Apr-09	4.30	5.12	5.02
2008	Mar-09	4.05	4.42	4.48
2009	Mar-09	4.46	5.20	5.32
2008	Feb-09	3.92	4.29	4.29
2009	Feb-09	4.25	4.98	4.99
2008	Jan-09	3.54	3.86	3.77
2009	Jan-09	3.96	4.60	4.40
2008	Dec-08	3.64	3.72	3.57

2009	Dec-08	4.41	4.57	4.27
2008	Nov-08	4.62	4.85	4.68
2009	Nov-08	5.24	5.69	5.37
2008	Oct-08	4.81	5.06	4.79
2009	Oct-08	5.44	5.95	5.41
2008	Sep-08	4.59	4.89	4.79
2009	Sep-08	4.91	5.50	5.31
2008	Aug-08	4.64	4.97	4.98
2009	Aug-08	4.78	5.45	5.46
2008	Jul-08	4.69	5.03	5.06
2008	Jun-08	4.75	5.08	5.14
2008	May-08	4.61	4.95	5.03
2008	Apr-08	4.47	4.81	4.94
2008	Mar-08	4.37	4.79	4.91
2008	Feb-08	4.44	4.85	5.03

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Vita

Devan McDonald was born in Gulfport, Mississippi, on October 26, 1985. Her parents, currently residing in Wiggins, Mississippi, are James F. and Joan Cockrell. She received a Bachelor of Science in mathematics and statistics from the University of South Alabama in May 2008. In August, 2008, she entered the Graduate School at the University of Texas at Austin.

Permanent address: 3408 Ambleside Drive
Austin, Texas 78759

This report was typed by the author.